

## **AMENDMENTS TO THE CLAIMS**

*The following listing of claims will replace all prior versions, and listings, of claims in the application:*

### **Listing of Claims:**

1.     **(Cancelled).**
2.     **(Currently Amended)**     The optical transistor of Claim 15, wherein the optical collector port comprises an orthogonally polarized or wavelength shifted optical beam, the orthogonally polarized or wavelength shifted optical beam being collinearly propagated with an amplified signal generated from the optical signal ( $\lambda_B$ ).
3.     **(Currently Amended)**     The optical transistor of Claim 15, wherein the optical collector port is positioned in a plane on a wafer and is orthogonally or obliquely propagated relative to an amplified signal generated from the optical signal ( $\lambda_B$ ).
4.     **(Cancelled).**
5.     **(Currently Amended)**     ~~The optical transistor of claim 4, wherein the body~~  
~~comprises:~~ An optical transistor, comprising:  
          an optical base port for receiving an input optical signal ( $\lambda_B$ );  
          an optical emitter port for generating an amplified replica ( $\lambda_E$ ) of the input optical  
signal;  
          an optical collector port for generating an amplified inverted replica ( $\lambda_C$ ) of the  
input optical signal;  
          a body coupled to the optical base port, the optical emitter port, the optical  
collector port, the body further comprising:  
          a bottom Distributed Bragg Reflector (DBR);  
          an active region overlaying the bottom DBR;  
          a top DBR overlaying the active region;  
          a substrate placed underneath the bottom DBR;

a bottom cladding layer overlaying the bottom DBR;  
a top cladding layer disposed between the bottom DBR and the active region; and  
a confinement layer disposed between the top cladding layer and the top DBR.

6. **(Currently Amended)** The optical transistor of Claim 45, wherein the input optical signal propagates horizontally through the active region to generate an amplified replica ( $\lambda_E$ ).

7. **(Currently Amended)** The optical transistor of Claim 6, wherein the input optical signal propagates horizontally through the active region and vertically through the top cladding layer, the confinement layer, and the top DBR, to generate thean amplified inverted replica ( $\lambda_C$ ).

8. **(Original)** A method for an optical transistor, comprising:  
receiving an input light signal ( $\lambda_B$ ) with stimulated emission; and  
responsive to the input light signal, generating a first amplified replica light output signal ( $\lambda_E$ ); and  
responsive to the input light signal, generating a second inverted amplified replica light output signal ( $\lambda_C$ );  
wherein the first amplified replica light output signal ( $\lambda_E$ ) and the second inverted amplified replica light output signal ( $\lambda_C$ ) share a ballast cavity.

9. **(Original)** The method of Claim 8, further comprising:  
injecting the input light signal ( $\lambda_B$ ) that is orthogonal to the second inverted amplified replica light output signal ( $\lambda_C$ ).

10. **(Original)** The method of Claim 8, where the first amplified replica light output signal ( $\lambda_E$ ) is linear or gain stabilized by either optical feedback of a laser, an injected optical signal, or pump or electrical modulation.

11. **(Original)** The method of Claim 8, wherein the second inverted amplified replica light output signal ( $\lambda_C$ ) is linear or gain stabilized by either optical feedback of a laser, an injected optical signal, or pump or electrical modulation.

12. **(Original)** The method of Claim 8, wherein the input light signal ( $\lambda_B$ ) comprises generates an unidirectional signal flow, thereby providing isolation between the input light signal ( $\lambda_B$ ) and the second inverted amplified replica light output signal ( $\lambda_C$ ).

13. **(Currently Amended)** An optical transistor, comprising:  
an optical base port for receiving an optical signal ( $\lambda_B$ );  
an optical emitter port for generating an amplified replica ( $\lambda_E$ ) of the input optical signal;  
an optical collector port for generating an amplified inverted replica ( $\lambda_C$ ) of the input optical signal;  
a body coupled to the optical base port, the optical emitter port, the optical collector port; and  
wherein the input optical signal propagates horizontally through an active region of the body to generate the amplified replica ( $\lambda_E$ ) and vertically through a top cladding layer, a confinement layer, and a top Distributed Bragg Reflector layer of the body, to generate the amplified inverted replica ( $\lambda_C$ ).~~a means to obtain unidirectional signal flow from the optical base port to the optical emitter port or the optical collector port.~~